

CLAIMS

1. A support element for mounting at least two wave-modifying elements (5, 5', 5'') with supporting surfaces (2, 2', 2'') which are arranged in mutually parallel relationship, characterised in that the supporting surfaces (2, 2', 2'') each have at least one opening, wherein the openings are connected together by way of at least one through bore (3).
2. A support portion (1) according to claim 1 characterised in that it is in one piece.
3. A support portion according to claim 1 or claim 2 characterised in that at least one and preferably a plurality of wave-modifying elements (5, 5') are disposed on a supporting surface (2, 2', 2'') in such a way that an opening (3) is at least partially and preferably completely covered by a respective one or more wave-modifying elements.
4. A support portion according to one of claims 1 to 3 characterised in that at least one supporting surface (2, 2', 2'') has an opening for coupling a light signal in and/or out.
5. A support portion according to one of claims 1 to 4 characterised in that at least one supporting surface (2, 2', 2'') has at least two openings and an opening of the other supporting surface (2') is on the central perpendicular on the connecting line between the two openings of the first supporting surface (2).
6. A support portion according to one of claims 1 to 5 characterised in that the openings are formed by circular bores, slots or recesses.
7. A support portion according to one of claims 1 to 6 characterised in that the openings are formed by bores (3) which extend substantially perpendicularly to the supporting surfaces (2, 2', 2'') and which extend into a channel (4) extending substantially parallel to the supporting surfaces, wherein the channel (4) is preferably in the form of a circular bore.
8. A support portion according to one of claims 3 to 7 characterised in that the wave-modifying element (5, 5') is fixed on the supporting surface (2, 2', 2'') with a bonding agent, preferably adhesive.
9. A support portion according to one of claims 1 to 8 characterised in that it is made from ductile material.

10. A support portion according to one of claims 1 to 9 characterised in that it is made from steel, iron, copper, nickel silver, silver, gold, brass, plastic material, preferably POM or PEEK.
11. A support portion according to one of claims 1 to 10 characterised in that at least one supporting surface (2) has a spacer element (6) on the side remote from another supporting surface (2').
12. A support portion according to claim 11 characterised in that the spacer element (6) has two abutment surfaces which extend in mutually parallel relationship.
13. A support portion according to claim 11 or claim 12 when appendant to claim 3 or a claim appendant thereto characterised in that the spacer element (6) has a through passage on the side towards the supporting surface (2, 2'), in which the wave-modifying element (5, 5') is arranged.
14. A support portion according to one of claims 11 to 13 characterised in that the spacer element (6) comprises a precision film.
15. A support portion according to claim 11 or claim 12 characterised in that the spacer element (6) comprises at least one pin which extends through both supporting surfaces (2, 2').
16. A support portion according to claim 15 characterised in that the spacer element (6) is formed by at least two pins, wherein the pins are preferably of a different length and/or comprise different material, wherein the difference in length and/or the choice of material is so selected that a relative movement of a coupling device fixed to the support portion with respect to the support portion as a consequence of a fluctuation in temperature is at least partially compensated.
17. A support portion according to one of claims 11 to 16 characterised in that the spacer element (6) and the support portion (2) are integral.
18. A support portion according to one of claims 1 to 17 characterised in that there are provided at least three mutually parallel supporting surfaces (2, 2', 2'').
19. A support portion according to one of claims 1 to 18 characterised in that at least one wave-modifying element is a narrow-band mirror.

20. A multiplexer/demultiplexer having a support portion according to one of claims 1 to 19.
21. A beam splitter, branching device and/or coupler having a support portion according to one of claims 1 to 19.
22. A method of producing a support portion for mounting at least two wave-modifying elements, which comprises the following steps:
selecting a material block having a first and a second surface,
providing one or more through passages or through bores which open into openings in the first and/or second surface of the material block, so that the through passages connect the first and second surfaces together, and
producing at least two supporting surfaces which extend in mutually parallel relationship, wherein the one supporting surface is arranged on the first surface of the block and the other supporting surface is arranged on the second surface of the block.
23. A method according to claim 22 characterised in that the supporting surfaces are produced after the through passages have been provided.
24. A method according to claim 22 or claim 23 characterised in that the supporting surfaces are produced with an averaged roughness depth R_z (in accordance with DIN 4768) of less than 100 nm, preferably less than 50 nm, particularly preferably less than 20 nm.
25. A method according to one of claims 22 to 24 characterised in that the supporting surface is produced with a cutting method, preferably by ultra-precision machining, particularly preferably by diamond turning or diamond milling.
26. A method according to claim 25 characterised in that the supporting surface is produced by a turning method, wherein the material block is clamped on the periphery of a rotating device in such a way that the supporting surfaces to be produced are oriented perpendicularly to the axis of rotation of the rotating device.
27. A method according to claim 26 characterised in that all supporting surfaces are produced in one clamping procedure.
28. A method according to one of claims 22 to 27 characterised in that a channel which preferably extends approximately parallel to the supporting surfaces is provided, wherein the channel is preferably in the form of a bore.

29. A method according to one of claims 22 to 28 characterised in that at least one spacer element with at least one abutment surface is fitted.
30. A method according to claim 29 characterised in that the abutment surface of the spacer element is produced in one clamping procedure together with the supporting surfaces.
31. A method of producing an optical modifier, which comprises the following steps:
producing a support portion with a method according to one of claims 22 to 29,
placing at least one wave-modifying element on a supporting surface, and
fixing the wave-modifying element on the supporting surface.
32. A method according to claim 31 characterised in that fixing is effected with a bonding agent, preferably adhesive.